What we claim is:

1. An optical single-sideband modulated wave generator, comprising:

optical modulator means for amplitude modulating an optical carrier by an electric modulation signal to obtain an optical double-sideband modulated signal , and

optical signal sideband suppressor means for suppressing either one of the sidebands of said optical double-sideband modulated signal to derive therefrom an optical single-sideband modulated signal ;

said optical modulator means, comprising:

an optical carrier terminal for receiving said optical carrier;

an electric modulation signal terminal for receiving said electric modulation signal;

at least one optical amplitude modulator for amplitude-modulating said optical carrier by said electric modulation signal to obtain said optical double-sideband modulated signal;

a two-output waveguide optical branching unit for branching the input to or output from said optical amplitude modulator into first optical waveguide path and second optical waveguide path; and

at least one optical-carrier phase shifter disposed in at least one of said first optical waveguide path and second optical waveguide path, for phase shifting said optical carrier as required;

wherein first optical double-sideband modulated signal and second optical double-sideband modulated signal are provided at the outputs of said first optical waveguide path and said second optical waveguide path, respectively;

said optical signal sideband suppressor means, comprising:

optical combiner means for combining said first optical double-sideband modulated signal and said second optical double-sideband modulated signal;

wherein said required phase shift by said optical-carrier phase shifter is defined such that optical carrier signals of said first optical double-sideband modulated signal and said second optical double-sideband modulated signal have a relative phase difference of 90° when said first optical double-sideband modulated signal and said second optical double-sideband modulated signal are combined in said optical combiner means;

wherein a baseband-signal-component 90° phase shifter is provided in one of said first and second optical waveguide paths to provide a 90° phase difference between a base band signal component in said optical double-sideband modulated signal from said one of said first optical waveguide-path and said second optical waveguide-path and a base band signal component in said optical double-sideband modulated signal from the other of said first optical waveguide path and said second optical waveguide path when said first and second optical double-sideband modulated signals are combined in said optical combiner means; and

wherein an optical delay circuit is provided in the other of aid first optical waveguide path and said second optical waveguide path to delay said optical double-sideband modulated signal from said other optical waveguide path for a predetermined time provided in said baseband-signal-component 90° phase shifter.

2. An optical single-sideband- modulated signal generator according to claim 1, characterized in that:

said optical modulator means comprises:

an optical carrier terminal for receiving said optical carrier;

an electric modulation signal terminal for receiving said electric modulation signal;

a two-output waveguide optical branching unit for branching said light carrier wave from said optical carrier terminal into first optical waveguide path and second optical waveguide path;

first optical amplitude modulator mans and second optical amplitude modulator mans placed in said first optical waveguide path and second optical waveguide path, respectively, for amplitude-modulating said optical carriers branched from said two-output waveguide optical branching unit by said electric modulation signal to obtain first optical double-sideband modulated signal and second optical double- modulated signal; and

at least one optical-carrier phase shifter disposed in at least one of said first optical waveguide path and second optical waveguide path, for phase-shifting said optical carrier as required;

wherein said first optical double-sideband optical modulated signal is obtained at the output of said first optical waveguide path, while said second optical double-modulated signal is provided at the output of said second optical waveguide path.

3. An optical single-sideband modulated wave generator according to claim 1, characterized in that:

said optical modulator means comprises:

an optical carrier terminal for receiving said optical carrier;

an electric modulation signal terminal for receiving said electric modulation signal;

optical amplitude modulator means for amplitude-modulating said optical carrier by said electric modulation signal to obtain said optical double-sideband modulated signal;

a two-output waveguide optical branching unit for branching said optical double-sideband modulated signal from said optical amplitude modulator means to provide first optical double-sideband modulated signal and second optical double-sideband modulated signal to first optical waveguide path and second optical waveguide path; and

at least one optical-carrier phase shifter disposed in at least one of said first optical waveguide path and second optical waveguide path, for phase

shifting said optical carrier as required;

wherein said first optical double-sideband modulated signal is obtained at the output of said first optical waveguide path, while said second optical double-sideband modulated signal is provided at the output of said second optical waveguide path.

4. An optical single-sideband modulated signal generator according to claim 1, characterized in that:

said baseband-signal-component 90° phase shifter comprises:

a two-output auxiliary waveguide optical branching unit for further branching said first optical waveguide to form first auxiliary waveguide path and second auxiliary waveguide path; and

auxiliary optical combiner means for combining the outputs from said first auxiliary optical waveguide path and second auxiliary optical waveguide path;

wherein at least one optical-carrier phase shifter is disposed in at least one of said first auxiliary optical waveguide path and second auxiliary optical waveguide path, for inverting the phase of said optical carrier signal propagating through said first auxiliary optical waveguide path with respect to said optical carrier propagating through said second auxiliary optical waveguide path; and

wherein an auxiliary optical delay circuit is disposed in said second auxiliary optical waveguide path, in case of combining in said auxiliary optical combiner means, for delaying said signal baseband component by a time interval twice longer than a desired time length obtainable by 1/2(f) of a reference baseband frequency range f over which the shift amount of said baseband-signal-component 90° phase shifter is effective.

5. An optical single-sideband modulated signal generator according to claim 4, characterized in that:

said optical baseband-signal-component 90° phase shifter further

comprises:

a second two-output auxiliary waveguide optical branching unit for further branching said first optical waveguide to form third auxiliary waveguide path and fourth auxiliary waveguide path;

second auxiliary optical combiner means for combining the outputs from said first auxiliary optical waveguide path and second auxiliary optical waveguide path;

a third two-output auxiliary waveguide optical branching unit for further branching said second optical waveguide to form fifth auxiliary waveguide path and sixth auxiliary waveguide path; and

third auxiliary optical combiner means for combining the outputs from said fifth auxiliary optical waveguide path and sixth auxiliary optical waveguide path;

wherein said optical delay circuit is placed in said fourth auxiliary optical waveguide;

wherein a second auxiliary optical delay circuit is disposed in said fifth auxiliary optical waveguide path, in case of combining in said third auxiliary optical combiner means, for delaying said signal baseband component by a time interval four times longer than a desired time length obtainable by 1/2(f) of the reference baseband frequency range f over which the shift amount of said baseband-signal-component 90° phase shifter is effective; and

wherein a third auxiliary optical delay circuit is disposed in said sixth auxiliary optical waveguide path, in case of combining in said third auxiliary optical combiner means, for delaying said signal baseband component by a time interval six times longer than the desired time length obtainable by 1/2(f) of the reference baseband frequency range f over which the shift amount of said baseband-signal-component 90° phase shifter is effective.

6. An single-sideband modulated signal generator according to claim 1,

characterized in that:

said baseband-signal-component 90° phase shifter comprises:

an n-output waveguide optical branching unit for further branching said first optical waveguide into first to n-th (n being an even number) auxiliary optical waveguides which are divided into a first half-number group including at least one auxiliary optical waveguide and a second half-number group including at least one auxiliary optical waveguide path not included in said first half-number group so that the number of auxiliary optical waveguide path included in said first half-number group is equal to the number of auxiliary optical waveguide path included in said second half-number group; and

auxiliary optical combiner means for combining the outputs from said first to n-th auxiliary optical waveguides;

wherein an auxiliary optical-carrier phase shifter is disposed in at lease one auxiliary optical waveguide path included in at least one of said first and second half-number groups, for inverting the phase of said optical carrier of said optical double-sideband modulated signal propagating through said auxiliary optical waveguide included in said first half-number of groups with respect to the phase of said optical carrier of said optical double-sideband modulated signal propagating through said auxiliary optical waveguide included in said second half-number group; and

wherein at least one optical delay circuit is disposed in at least one of said first to n-th auxiliary optical waveguide paths, in case of combining in said auxiliary optical combiner means, for delaying said signal baseband component by a time interval even-number times longer than a desired time length obtainable by 1/2(f) of the reference baseband frequency range f over which the shift amount of said baseband-signal-component 90° phase shifter is effective.

7. An optical single-sideband modulated signal according to any one of

claims 1 to 6, characterized in that an optical signal adjuster for adjusting the optical signal amplitude is provided in at least one of said first and second optical waveguide paths and said first to n-th auxiliary optical waveguide paths.